

Assessment and Treatment of Adult Acute Responses to Traumatic Stress Following Mass Traumatic Events

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FOCUS POINTS

- Interventions in the early recovery phase following mass traumatic events are not currently well-supported by empirical literature.
- Stress and traumatic stress theory as well as research on risk and recovery factors and expert consensus can guide early intervention efforts.
- Early interventions should be aimed at the full spectrum of survivors, from those who need stress management and education to those who need more intensive interventions.
- Early intervention in mass traumatic events should be embedded within a multidisciplinary, multi-tiered disaster mental health system.
- Early interventions should be utilized in a culturally sensitive manner, related to the local formulation of problems and ways of coping, and applied flexibly, in ways that match needs and situational context and take into account the ongoing stressors, reactions, and resources.

and mass trauma systems are described. This article concludes with brief guidelines for longer-term interventions and recommendations for future research.

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INTRODUCTION

In an effort to find preventive interventions following mass traumatic events, the field of post-traumatic early intervention has received much attention in the last few years. Progress in this field has been beset by difficulties in obtaining empirical support, as well as lack of a conceptual framework in which to organize clinical, consensus, and research recommendations. Interventions in the immediate aftermath of mass traumatic events have received very little solid research support, and in the absence of theoretically derived organizing principles, planners often perceive two contradicting recommendations: an "intervention for all" (eg, group debriefing) strategy, and a "wait and see" strategy (ie, doing nothing until passage of time reveals those in need of formal treatment from those who recover on their own). There are no comparative studies of the two different interventions strategies at this time.

This article will attempt to offer some principles for determining how to offer assistance appropriately suited to survivors in the early aftermath¹ of either a mass traumatic event. Components of assessment and early intervention will be delineated based on: stress and traumatic stress theories; empirical literature on risk and recovery response in survivors of trauma; the theory of stress and traumatic stress; and expert consensus.

ABSTRACT

Assessment and treatment of acute responses to traumatic stress has received much attention since September 11, 2001. This article elucidates principles of early intervention with adults in the immediate (within 48 hours) and early recovery phase (within the first week). The principles have been drawn from research on risk and recover factors, stress and traumatic stress theory, and expert consensus recommendations. The debriefing model is discussed, and principle interventions of psychological first aid, pharmacology,

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STRESS THEORY

The early aftermath of traumatic events clearly includes elements of both stress and traumatic stress, and this has caused confusion between two categories of early intervention: stress management and prevention of posttraumatic stress disorder (PTSD). Stress theory assumes that external demands (eg, the traumatic event as primary stressor) evoke responses that draw on inner and external resources. Loss of resources, either concrete (social, financial) or symbolic (beliefs, expectations) may, as secondary stressors, significantly impact the recovery trajectory.¹ Survivors' own responses (eg, anxiety, insomnia, depression) may additionally tax overall resources, becoming tertiary stressors.² With sufficient infusion of resources and the passage of time, recovery is the expected outcome of time-limited exposure to a stressor (with great variation depending on the intensity and duration of the stressor).^{3,4} Given that the level of stress has not exceeded a threshold from straining the "biopsychosocial system" to "fracturing" it (traumatic stress), many of the components of crisis intervention aim to provide the resources that help support, organize, and devise a plan for survivors.⁵

From this perspective, feeling better following trauma and having a sense of support may shape one's perception of the traumatic event, one's own responses, and one's belief in a positive outcome of the situation. However, secondary stressors, deterioration of resources and self-perpetuating, distressing symptoms may interfere with recovery. Therefore, stress management typically involves identifying and ameliorating those factors that interfere with recovery (eg, lack of supportive others, ongoing stressors, maladaptive beliefs).

Within stress theory, four observable indicators of successful coping are sustained task performance; controllability of emotion; sustained capacity to enjoy rewarding human contacts; and sustained a sense of personal worth.⁶ Accordingly, a failure to cope will be expressed in reduced task performance, overwhelming emotions, inability to relate to others and self-blame (or self-denigrating rumination). The expected outcome of stress management is improved coping, as expressed by improved task performance, better interpersonal interactions, controllable emotion and sustained self-esteem. Early interventions for those who have suffered severe stress may facilitate this outcome by providing interventions designed to reduce excessive, uncontrollable distress, correct negative appraisal, facilitate social connectedness, and provide pragmatic resources. For instance, solution-focused

methods assist survivors identify and utilize their strengths in the recovery process by helping them define concerns, imagine and set goals, identify strategies to achieve the goals, and develop an action plan.⁷

TRAUMATIC STRESS THEORY

Psychobiological research has identified and mapped biological processes that are distinctly reactive to traumatic stress.⁸ (Shalev AY, MD, unpublished data, 2004) These findings support the proposition that perceived threat triggers intense bodily reactions that, in their turn, shape the subjective quality of mental traces of the event, as well as the interpretation of subsequent adversity. This cycle of biopsychological events can be self-limited and decay with time. However, when responses are overwhelming, uncontrollable, and involve extreme physiological arousal, they may consolidate the link between fear and traumatic recall, leading to avoidance, repeated recall, and, ultimately, to PTSD. Additional adversity, such as often seen in the aftermath of major disaster, can create a chain of mutually reinforcing reactions, the memory of which may be etched forever in a person's brain.

Consistent with stress theory, PTSD risk factor findings^{9,10} suggest that early social support is an extremely important mediator of recovery from traumatic stress. Efforts to reduce the stressfulness of events (eg, by providing shelter, information, orientation, warmth, and hope) are a primary intervention, having the essential role in mitigating the "bio-psychological cascade" (Shalev AY, MD, unpublished data, 2004) created by perceived threat. Human presence, if soothing to trauma survivors, may have profound biological as well as psychological effects. The early aftermath of traumatic events is a critical period of enhanced neuronal plasticity, during which psychological factors and bodily "physiological" concur to either "kindle" chronic stress disorders or foster a sense of meaningfulness, adaptation and resilience.

However, studies^{11,12} on the relative contribution of early arousal to subsequent PTSD, and the possible pharmacologic strategies to reduce expressed adrenergic activity, suggest that the initial "stress response" is a necessary but not sufficient cause of traumatic stress disorders. Therefore, in those at significant risk for developing PTSD, efforts to reduce stress alone are not sufficient to prevent PTSD.¹³ It is the incongruous, intrusive, distressful, and unremitting recollections, as well as the cognitive and behavioral response to them, that are the unique factors addressed by trauma theory above and beyond stress theory.

Intrusive recollections are not just stressful, in the sense of signaling threat: they tax survivors' cognition, schema, and mapping of reality. These type of memories do not abate when the stressor ends, and are not amenable to "stress management." They do not stem merely from a threat to life but from a threat to one's image of the world. These memories challenge rules, expectations and assumptions and therefore pose a different challenge.

The Schematic, Propositional, Analogue, and Associative Representational Systems (SPAARS)¹⁴⁻¹⁸ model of emotional experiences incorporates elements of three key cognitive models of PTSD. According to this theory, when a traumatic event occurs, information encoded in different systems is appraised as incompatible with existing cognitive schemas. There is additionally a chronic activation of the "fear" mode in an associative network, leading to hyperarousal symptoms. Information related to the trauma intrudes via this hyperactivated state, expressed as repeated intrusive recollections. Also occurring are cognitive processing biases, such that cues related to the trauma are selectively processed and themselves activate the trauma-related information in memory, further increasing reexperiencing symptoms. The SPAARS model predicts that preexisting life events, elements of the traumatic event, and schematic representations of the world and self may affect how an individual reacts to and recovers from trauma. For example, while individuals with realistic schemas about the world and/or their own efficacy may recover with social support and resources, individuals with negative schemas of self and/or world may require additional assistance from mental health providers.

Not every stressful event comprises challenges to cognitive processing and self-schema. One can escape from a traumatic event and be thankful for having remained alive. Yet, if novel and incongruous experiences, such as exposure to extreme brutality or disfigured dead bodies are experienced, fragments of the traumatic event intrusively appear, often with great intensity.¹¹ Prevention of PTSD requires additional therapeutic procedures that focus on the traumatic experience itself, rather than the level of stress experienced.

Because the drive to express intrusive recall and the pressure to remember the traumatic event are nearly universal in trauma survivors, it has been hypothesized that they are essentially adaptive responses, in their potential to enhance communication with others and initiate learning and reappraisal.¹⁹ Other common expressions following

trauma (eg, rigid avoidance of re-telling the story) may prevent communication, decrease helping responses, and consolidate the link between traumatic memories and negative emotion. In other words, early responses, such as the drive to avoid danger, may have survival value in removing the individual from harm's way, but might ultimately negatively impact the recovery process.

ASSESSMENT

How does a provider determine who may warrant support beyond what their natural social network can provide? Determining the salient risk and recovery factors for each unique individual and situation has been recommended as a way to increase the probability of providing the appropriate support to the right individuals, at the right time. Applying the literature regarding risk and recovery factors to assessment in the immediate posttrauma phase has both strengths and weaknesses.

Risk Factors

Initial symptoms expressed following trauma are labile, intense, and highly reactive to ongoing circumstances, and reactions expressed may not reflect psychopathology (Table 1) (Shalev AY, MD, unpublished data, 2004).^{3,4,9} Therefore, it may be difficult to target individuals who may benefit from intervention, versus those for whom normal healing processes are already operating, and sufficient assistance is already being provided by natural supporters and healers. Additionally, because

TABLE 1. POSSIBLE ACUTE RESPONSES TO TRAUMA

Domain	Negative Responses	Positive Responses
Cognitive	Confusion, disorientation, worry, intrusion	Determination, sharper perception, fearlessness
Emotional	Shock, sorrow, grief, sadness, fear	Feeling challenged, involved, pressured to act
Interpersonal	Withdrawal, anger	Affiliation, helping response, altruistic behavior
Physiological	Fatigue, headache, muscle tension, heart rate	Alertness, activation

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most individuals exposed to trauma do not develop chronic posttraumatic mental health problems,⁹ (Shalev AY, MD, unpublished data, 2004) at this stage, knowledge of pre-, peri-, and post-event risk factors may not be the most reliable way to predict long-term adjustment, as there is no formal way to weigh risk factors for each individual situation.

Utilizing intensity or type of early symptom to predict long-term difficulties is not recommended because studies¹⁵ indicate that no particular symptom or constellation of symptoms is pivotal in predicting long-term adjustment to trauma across all situations. Different studies³ emphasize varying symptoms as being important, and while mathematical models are strongly recommended by researchers in the field,²⁰ there currently is no convergence on which symptoms should be weighted more heavily, with whom, and when. However, assessment in the immediate phases posttrauma may serve the following functions:

To identify problems that require immediate attention (eg, uncontrollable responses, gross mental status impairment, suicidality). This also involves assessing the extent to which early responses interfere with adaptive ability to communicate with others, with ability to relax and allocate attention to additional tasks, and with core physiological functions such as sleep, bodily tension, and autonomic arousal.¹⁹

To monitor "high-risk" individuals for future interventions. While symptom severity in the first few days post-incident does not predict later PTSD well, the severity of early posttrauma symptoms from ~1–2 weeks after the trauma correlates highly with subsequent symptom severity.²¹ Therefore, identifying high-risk individuals (eg, those most highly exposed) for follow-up with a symptom-based instruments may be the most promising approach to detecting risk for PTSD in affected populations. Other than the range of symptoms found in *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision*²² symptoms that are most conducive to developing PTSD have as common denominators their incapacitating nature, their pervasive presence, and their domination of other mental activities.²³

Develop an intervention plan that targets those post-disaster factors which can be modified or ameliorated. Risk factors related to social support and ongoing post-event stressors have the strongest predictive power in development of PTSD, and can potentially be modified if identified in the immediate phase posttrauma.⁹ Early guidance may

also be able to identify and prevent negative cognitions, which are associated with the development of PTSD (Tables 2–4).

Intervention plans may also identify and reinforce existing strengths as well as introduce components known to foster recovery. A growing body of literature suggests that coping and resilience are the norm following trauma.^{24–26} The empirical literature shows that recovery is promoted by finding benefit, sense of relationship with the divine, sense of self-efficacy, cognitive-behavioral trauma treatment, individually chosen disclosure and social support, the perception that the social milieu accepts one's reactions and welcomes disclosure, and seeing oneself as a hero or survivor rather than a victim.²⁵ Responses themselves may not be as important as the degree to which the survivor is able to continue task-oriented activity, regulate emotion, sustain positive self value, and maintain and enjoy rewarding interpersonal contacts (Tables 1 and 3).

INTERVENTIONS

Determining the most effective interventions following mass traumatic events depends on a number of factors, including available resources, the nature of the event, the goals of the intervention strategies, and timing of the intervention. A number of different interventions are described below, along with recommendations for their use.

Debriefing

A current debate in the field of early intervention following mass traumatic events centers around evidence from randomized controlled trials that has shown that one-to-one "psychological debriefing" is associated with lack of impact on later distress or psychopathology.²⁷ Mass violence expert panelists²⁸ who recently reviewed the literature on debriefing concluded that any intervention that involves prompted retelling of the event in a way designed to recount or "process" emotional reactions was not recommended for primary victims in the first week or two following a mass violence event.²⁸ Operational debriefing may be appropriate for rescue and emergency workers, if accompanied by additional assessment and intervention as indicated. These experts also concluded that because coping and resilience are the norm following trauma, and because the pattern of responses following trauma is so labile and polymorphous, there should be no compulsory procedures that impose a particular model or timeline of recovery on survivors of mass violence.

Psychological First Aid

Another model recommended by expert panelists for early intervention following disasters and mass violence is psychological first aid.²⁹⁻³⁴ Components of psychological first aid involve some combination of establishing safety (eg, evacuation, protection from reminders); facilitating social connection and access to additional resources; and reducing event reactions (via education regarding what to expect,

basic relaxation, cognitive reframing, and re-establishing a sense of efficacy).

The interventions included in psychological first aid have not been tested empirically. Because psychological first aid components do not include assessment of risk and recovery factors and monitoring individuals for follow-up, further research will need to delineate if they are a sufficient measure for preventing long term distress and psy-

TABLE 2. RISK FACTORS ASSOCIATED WITH CONTINUING MENTAL HEALTH PROBLEMS FOLLOWING TRAUMA^{3,4,9,20}

Pre-Event Risk Factors

Survivor Characteristics

- Female gender
- 40–60 years of age
- No experience in coping techniques
- Ethnic minority
- Low socioeconomic states
- Prior psychiatric diagnosis
- Prior trauma
- Below-average cognitive ability
- Neuroticism (proneness to experience irritability, depression, and anxiety)
- Family context variables:
 - Being an adult with children
 - Being a female with a spouse
 - Being a child with a dysfunctional parent
- Instability in family of origin

Resource context variables

- Low belief in ability to control outcomes
- Deteriorating social resources

Within-Disaster Risk Factors

Severity of Exposure

- Direct involvement in the event
- Witnessing the event
- Injury
- Reason to fear death or serious injury to themselves or their loved ones
- Life threat
- Panic
- Horror
- Bereavement
- Relocation or displacement
- Extreme loss
- Disrupted community

Post-Disaster Risk Factors

- Resource deterioration
- Social support deterioration
- Social criticism
- Marital distress
- Loss of home/property and financial loss
- Decline in perceived social support
- Alienation and mistrust
- Peritraumatic reactions
- Derealization and time distortion (1-week posttrauma)
- Emotional numbing, motor restlessness and a sense of reliving the trauma (within 1 month posttrauma)
- Negative perceptions of other people's responses
- Negative perceptions of symptoms

- Exaggeration of future probability of trauma
- Catastrophic attributions of responsibility
- Avoidance coping

Presence of secondary psychological stressors

- Police interrogation
- Media attention
- Prolonged relocation
- Continued separation and estrangement from family and friends
- Bewilderment
- Disorientation
- Uncertainty about safety of self and significant others
- Missing family members
- Continued lack of control over what is happening.

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chopathology in high risk individuals. Based on studies¹³ showing that the initial 'stress response' is a necessary but not sufficient cause of traumatic stress disorders, it is expected that efforts to reduce stress alone in the immediate phase are not sufficient to prevent PTSD in those at significant risk for developing PTSD.

For highly distressed or highly exposed individuals, the psychological first aid model may need to be supplemented with the following clinical interventions: determining who may need containment of uncontrollable physiological and psychological responses; treating specific symptoms, such as overwhelming anxiety, depression, and dissociation,

when they interfere with accessing social support and processing the incident; promoting memory consolidation and integration by reducing psychological arousal and distress and promoting sleep; and informally assessing risk and recovery factors initially so that individuals can be monitored for possible follow-up care.¹¹

Pharmacotherapy

For those individuals who are having intense difficulty controlling their own responses with the psychosocial methods discussed above, pharmacotherapy may additionally be indicated. Briefly, while there is evidence for symptom-focused amelioration with certain pharmacologic agents (ie, sleep induction, reduction of anxiety), there has been very little research assessing its use in the immediate phases post-event as a preventive for chronic symptoms. Imipramine in low doses shows significant reduction in acute stress disorder symptoms.³⁵ Propanolol administered in the first 6–12-hours posttrauma shows a later reduction in conditioned response to trauma stimuli.¹² Risperidone administered 5-days posttrauma is associated with decreased sleep disturbance, nightmares, flashbacks, and hyperarousal.³⁶ There is no evidence of a PTSD protective benefit with benzodiazepenes.³⁷

Extended Intervention Model

In situations of mass traumatic event, the expert consensus model.³⁸ assumes that many efforts can have a mental health impact on the community, even if not provided by mental health providers (ie, the quality of communication and coordination among responders, public confidence in leaders, and the accuracy and effectiveness of communications to the public about the risks and the appropriate actions to be taken). Expert panels strongly recommended that mental health interventions cannot be isolated, but are rather one part of the entire disaster response. They must be embedded in an entire system with the recognition that each aspect of disaster response will impact mental health. As a result, there are many possible roles and disciplines for individuals assisting in mental, social, and behavioral recovery following mass traumatic event (Table 5). These interventions are meant to be utilized in a culturally sensitive way, related to the local formulation of problems and ways of coping. They should be applied flexibly, in ways that match needs and situational context and take into account the ongoing stressors, reactions, and resources

TABLE 3. INDICATORS OF ADAPTIVE AND PATHOLOGICAL RESPONSE TO TRAUMA¹¹

Indicators of Adaptive Response

1. A low degree of distress (though this should not be confused with numbing or blunted affect)
2. Intrusive recollections that lead a survivor to recruit sympathy and help, as stated above
3. Upon repetition of the event, the trauma narrative becomes richer, includes other elements, and takes on a reflective tone (eg, "When I think about it now, I could have done worse.")
4. Nightmares that change from mere repetition of the event to more remote renditions

Indicators of More Pathological Responses

1. Continuous distress without periods of relative calm or rest
2. Severe dissociation symptoms that continue following a return to safety
3. Intense intrusive recollections that are fearfully avoided, experienced as a torment, or seriously interfere with sleep
4. Extreme social withdrawal
5. The inability to think about (rather than just emotionally experience) the trauma
6. Uncontrollable anxiety, anger, or grief (ie, incongruent with cultural norm)
7. Marked sleep difficulties, loss of appetite, or poor hygiene
8. Extreme cognitive impairment (eg, confusion, poor concentration, poor judgment, and poor decision-making, inability to make decisions, and overwhelming feelings of helplessness resulting in compromised self-care)

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FOLLOW-UP LONGER-TERM INTERVENTIONS

Whether utilizing psychosocial or pharmacological interventions, for those individuals at high risk for protracted, debilitating posttraumatic responses, there is an obligation to assess, monitor, and refer to empirically supported treatment interventions at the appropriate time. Providing cognitive-behavioral therapy to survivors with acute stress disorder in order to prevent PTSD exemplifies this approach.¹⁵ At this time, cognitive-behavioral therapies have the strongest empirical support for preventing enduring mental health problems in both individual traumas and mass traumatic events. They are recommended for trauma survivors no sooner than 2 weeks following the traumatic event, depending on multiple circumstances.^{13,39,40}

The literature on treatment for acute stress disorder¹¹ and PTSD⁴¹ suggests that processing traumatic recollections so that they are integrated into existing schemas requires time, reiteration, and good listeners. Because survivors often do not seek formal mental health treatment,⁴² the survivor's social network may be the ones assisting in processing the event, and later, helping find positive meaning in the event.¹³ Therefore, family and friends can be educated as to how to best help the survivor process the trauma, or support them in finding individuals who can.^{43,44}

Pharmacologically, while it is beyond the scope of this paper to discuss all forms of intervention in the

long-term follow-up, the use of selective serotonin reuptake inhibitors is indicated as the most empirically supported treatment for PTSD and depression.⁴⁵

CONCLUSION

The interventions described in this article have been based as much as possible on evidence related to risk and recovery factors, theory, and consensus. However, because of the lack of empirical support for these interventions, there may be multiple reasons why early interventions may be helpful for improving functioning and ameliorating short term distress, and yet insufficient in preventing chronic mental health problems in high-risk individuals. Firstly, PTSD and other concomitants of trauma (depression, substance use, anxiety disorders) have a complex etiology, and as stated above, the relative contribution of early and short interventions may be necessarily small. Early responses to trauma are changeable and highly responsive to ongoing stressors. It is therefore difficult to identify which persons are at risk for continued problems. It is also difficult to conduct interventions in the immediate aftermath of traumatic events. Multiple, ongoing stressors may impede survivors ability to engage in some of the most effective strategies for addressing posttraumatic responses. Finally, ethnic, political, and economic factors may contribute to differing goals for functioning and identity, and providers should be sensitive to the particular motivations and preferences of each survivor.¹⁹

TABLE 4. ASSESSMENT DOMAINS IN THE IMMEDIATE PHASE POSTTRAUMA^{3,4,9,11,20}

Risk/Recovery Domains	Secondary Stressors	Coping Efficacy
<ul style="list-style-type: none"> • Social network • Strengths and the weakness of the survivor's immediate supporters • Possible negative reactions in the environment • Possible negative interpretations of the event, of responsibility, of symptoms • Linkages to resources for practical help • Nature and extent of physical injuries • Prior anxiety and depression • Current depressive symptoms 	<ul style="list-style-type: none"> • Is the survivor secure and out of danger? • Does he or she have enough control of what is happening? • Are there major uncertainties in the present? • Are negative events (or news) still expected? • Does the survivor have clear enough information about self and significant others? • Has adequate human attention and warmth been given to the survivor? • Has trust been established between survivors and helpers? • Can the current conditions humiliate or dishonor the survivors? 	<ul style="list-style-type: none"> • Can the survivor continue task-oriented activity? • How well organized, goal directed, and effective is such activity? • Is the survivor overwhelmed by strong emotions most of the time? • Can emotions be modulated when such modulation is required? • How isolated, alienated, or withdrawn is the survivor? • Does the survivor seek the company of others or avoid it?

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As the field begins to agree on core elements of early intervention, it is apparent that we need to empirically determine whether these practices are effective in ameliorating specific outcomes, or whether new interventions should be designed to accomplish such objectives. The development of unique delivery systems for providing interventions^{46,47} also hold promise for situations where face to face contact is impossible. Also on the horizon is the development of more efficient and accurate assessment procedures for identifying individuals at high risk for progressing to chronic posttraumatic problems.²¹ Finally, advances in psychobiology and

genetics also promise to offer keys to identification and amelioration of acute response to trauma in ways that may hold great promise for prevention of long-term suffering.⁴⁸ **CNS**

TABLE 5. EXPERT PANEL RECOMMENDATIONS FOLLOWING MASS TRAUMA IN THE IMMEDIATE PHASE*

Interventions following mass traumatic events: impact to 2 weeks

1. Attend to basic needs, such as food, first aid, and shelter.
2. Be sure soothing human contact is available. Offer comfort and support.
3. Provide immediately applicable information (eg, parenting issues and normal responses).
4. Offer consultation, training, and technical assistance to organizations, community leaders, responders, and caregivers.
5. As needed, offer "psychological first aid": protect survivors from further harm; reduce physiological arousal; mobilize support for those who are most distressed; keep families together and facilitate the reunion of loved ones; provide education about available resources and coping strategies; and use effective risk communication techniques.
6. Assess needs and available resources.
7. Provide triage for individuals with uncontrollable responses.
8. Monitor the rescue and recovery environment.
9. Observe and monitor survivors. Conduct triage and refer for care or services as needed.
10. Outreach to affected individuals and communities. Disseminate essential information.
11. Foster family and community resilience and recovery.
12. Do no harm. This stage calls for a low level of interference and a high level of choice to balance out potentially negative effects.

* Defined as 1-week posttrauma for the purposes of this review, with understanding that this time frame varies depending on the nature of the incident.

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